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IN THE CLAIMS

1. (Currently Amended) A vapor analysis system comprising:
  - a vapor analyzer capable of collecting and analyzing a vapor sample for detection of a compound that may be contained within the vapor sample;
  - a controller coupled to the vapor analyzer, the controller programmed to produce an indicator signal indicative of a relative concentration of the compound detected by the vapor analyzer within the vapor sample; and
  - a sample probe including:
    - a housing supporting a vapor channel through which the vapor sample is collected;
    - a vapor cable coupling the vapor channel to the vapor analyzer to allow collection and channeling of the vapor sample to the vapor analyzer for analysis and detection of a compound that may be contained within the vapor sample; and
    - a multi-dimensional user indicator, the user indicator in communication with the controller to receive and operate in response to the indicator signal to indicate the relative concentration of the compound detected within the vapor sample for presentation via a multi-directional stimulus to a user of the vapor analysis system;

wherein the sample probe further comprises:

  - a user actuator coupled via a data communications channel to the controller to provide a user enter signal to the controller based on operation of the user actuator by a user of the vapor analysis system in order to control operation of a control program operating within the controller;
  - the control program causing the controller to operate the vapor analyzer in a survey mode to continually collect and monitor the vapor sample for detection of the compound that may be contained within the vapor sample;

the control program causing the controller to modulate the indicator signal to control an operation of the user indicator relative to the concentration of the compound detected by the vapor analyzer within the vapor sample such that a detected change in concentration of the compound causes the controller to change modulation of the indicator signal; and

the control program causing the controller to provide a predetermined threshold indicator signal modulation pattern when the vapor analyzer detects a threshold concentration of the compound that exceeds a predetermined value such that the user of the sample probe can determine from a multi-directional stimulus of the user indicator that the vapor analyzer has detected the threshold concentration of the compound by viewing the user indicator operated according to the predetermined threshold indicator signal modulation pattern; wherein:

during the survey mode, the control program receives a first user enter signal corresponding to a first activation of the user actuator by the user of the vapor analysis system;

in response to the first user enter signal, the control program enters a sampling mode to begin recording the concentration of the compound that may be contained within the vapor sample for a predetermined testing time period, and during the sampling mode, the control program provides a testing complete indicator signal modulation pattern to modulate the user indicator on the sample probe to indicate to the user that the control program is operating in the sampling mode; and

after the predetermined sampling time period has elapsed, the control program enters a sampling complete mode and providing a sampling complete indicator signal modulation pattern to modulate the user indicator on the sample probe to indicate to the user that the sampling mode is complete;

in the sampling complete mode, the control program receives a second user enter signal corresponding to a second activation of the user actuator by the user of the vapor analysis system; and

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in response to the second user enter signal, the control program causes the controller to:

i) save the recorded concentration of the compound associated with the vapor sample in a leak data route entry record of a route entry database maintained in a storage device coupled to the controller, the route entry record corresponding to a leak point near which the user operated the sample probe to collect the vapor sample from which the concentration of the compound was detected and recorded; and

ii) re-enter the survey mode to begin collecting a vapor sample again for a next leak point defined by a next route entry record in the route entry database;

wherein the control program causes the controller to repeat the processing operations of:

operating the vapor analyzer in the survey mode;

receiving the first user enter signal in survey mode to cause operation of the vapor analyzer in the sampling mode for the predetermined sampling period; and

upon expiration of the predetermined testing period, operating the vapor analyzer in the sampling complete mode and receiving the second user enter signal causing the controller to save the recorded concentration of the compound and re-enter the survey mode;

for a plurality of route entry records in the route entry database, such that a user of the vapor analysis system can perform testing of a plurality of leak points, each corresponding to a route entry in the route entry database, by only operating the user actuator on the sample probe and by sensing the multi-directional stimulus of the user indicator on the sample probe to determine an operating mode of the control program; and

wherein the user indicator comprises a light pipe disposed around a perimeter of the housing of the sample probe, the controller modulating the indicator signal to control an intensity of the light pipe relative to the

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concentration of the compound detected by the vapor analyzer within the vapor sample to visually indicate via light, to the user of the vapor analysis system:

i) operation of the control program in survey mode and sampling mode;

ii) the relative concentration of the compound detected by the vapor analyzer in the vapor sample;

iii) when the vapor analyzer has detected the threshold concentration that exceeds a predetermined value such that the user of the sample probe can determine that the vapor analyzer has detected the threshold concentration of the compound by viewing light produced by the user indicator operated according to the predetermined threshold indicator signal modulation pattern.

2. (Canceled) ~~The vapor analysis system of claim 1 wherein the sample probe further comprises:~~

~~—— a user actuator coupled via a data communications channel to the controller to provide a user enter signal to the controller based on operation of the user actuator by a user of the vapor analysis system in order to control operation of a control program operating within the controller;~~

~~—— the control program causing the controller to operate the vapor analyzer in a survey mode to continually collect and monitor the vapor sample for detection of the compound that may be contained within the vapor sample;~~

~~—— the control program causing the controller to modulate the indicator signal to control an operation of the user indicator relative to the concentration of the compound detected by the vapor analyzer within the vapor sample such that a detected change in concentration of the compound causes the controller to change modulation of the indicator signal; and~~

~~—— the control program causing the controller to provide a predetermined threshold indicator signal modulation pattern when the vapor analyzer detects a threshold concentration of the compound that exceeds a predetermined value such that the user of the sample probe can determine from a multi-directional~~

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~~stimulus of the user indicator that the vapor analyzer has detected the threshold concentration of the compound by viewing the user indicator operated according to the predetermined threshold indicator signal modulation pattern.~~

3. (Canceled) ~~The vapor analysis system of claim 2 wherein:~~

~~—— during the survey mode, the control program receives a first user enter signal corresponding to a first activation of the user actuator by the user of the vapor analysis system;~~

~~—— in response to the first user enter signal, the control program enters a sampling mode to begin recording the concentration of the compound that may be contained within the vapor sample for a predetermined testing time period, and during the sampling mode, the control program provides a testing complete indicator signal modulation pattern to modulate the user indicator on the sample probe to indicate to the user that the control program is operating in the sampling mode; and~~

~~—— after the predetermined sampling time period has elapsed, the control program enters a sampling complete mode and providing a sampling complete indicator signal modulation pattern to modulate the user indicator on the sample probe to indicate to the user that the sampling mode is complete.~~

4. (Canceled) ~~The vapor analysis system of claim 3 wherein:~~

~~—— in the sampling complete mode, the control program receives a second user enter signal corresponding to a second activation of the user actuator by the user of the vapor analysis system; and~~

~~—— in response to the second user enter signal, the control program causes the controller to:~~

~~—— i) save the recorded concentration of the compound associated with the vapor sample in a leak data route entry record of a route entry~~

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~~database maintained in a storage device coupled to the controller, the route entry record corresponding to a leak point near which the user operated the sample probe to collect the vapor sample from which the concentration of the compound was detected and recorded; and~~  
~~— ii) re-enter the survey mode to begin collecting a vapor sample again for a next leak point defined by a next route entry record in the route entry database.~~

5. (Canceled)      ~~The vapor analysis system of claim 4 wherein the control program causes the controller to repeat the processing operations of:~~  
~~— operating the vapor analyzer in the survey mode;~~  
~~— receiving the first user enter signal in survey mode to cause operation of the vapor analyzer in the sampling mode for the predetermined sampling period; and~~  
~~— upon expiration of the predetermined testing period,~~  
~~operating the vapor analyzer in the sampling complete mode and~~  
~~receiving the second user enter signal causing the controller to~~  
~~save the recorded concentration of the compound and re-enter the~~  
~~survey mode;~~  
~~— for a plurality of route entry records in the route entry database, such that a user of the vapor analysis system can perform testing of a plurality of leak points, each corresponding to a route entry in the route entry database, by only operating the user actuator on the sample probe and by sensing the multi-directional stimulus of the user indicator on the sample probe to determine an operating mode of the control program.~~

6. (Canceled)      ~~The vapor analysis system of claim 5 wherein the user indicator comprises a light pipe disposed around a perimeter of the housing of the sample probe, the controller modulating the indicator signal to control an intensity of the light pipe relative to the concentration of the compound detected~~

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~~by the vapor analyzer within the vapor sample to visually indicate via light, to the user of the vapor analysis system:~~

- ~~—— i) operation of the control program in survey mode and sampling mode;~~
- ~~—— ii) the relative concentration of the compound detected by the vapor analyzer in the vapor sample;~~
- ~~—— ii) when the vapor analyzer has detected the threshold concentration that exceeds a predetermined value such that the user of the sample probe can determine that the vapor analyzer has detected the threshold concentration of the compound by viewing light produced by the user indicator operated according to the predetermined threshold indicator signal modulation pattern.~~

7. (Currently Amended) The vapor analysis system of ~~claim 5~~ claim 1 further including a system housing enclosing the controller and the vapor analyzer, and wherein the user indicator comprises an audible transducer disposed in at least one of the housing of the sample probe and the system housing, the controller modulating the indicator signal to control an intensity of the audible transducer relative to the concentration of the compound detected by the vapor analyzer within the vapor sample to ~~visually~~ audibly indicate via sound, to the user of the vapor analysis system:

- i) operation of the control program in survey mode and sampling mode;
- ii) the relative concentration of the compound detected by the vapor analyzer in the vapor sample;
- ii) when the vapor analyzer has detected the threshold concentration that exceeds a predetermined value such that the user of the sample probe can determine that the vapor analyzer has detected the threshold concentration of the compound by listening to the sound produced by the user indicator operated according to the predetermined threshold indicator signal modulation pattern.

8. (Currently Amended) A vapor analysis system comprising:

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a vapor analyzer capable of collecting and analyzing a vapor sample for detection of a compound that may be contained within the vapor sample;

a controller coupled to the vapor analyzer, the controller programmed to produce an indicator signal indicative of a relative concentration of the compound detected by the vapor analyzer within the vapor sample; and

a sample probe including:

a housing supporting a vapor channel through which the vapor sample is collected;

a vapor cable coupling the vapor channel to the vapor analyzer to allow collection and channeling of the vapor sample to the vapor analyzer for analysis and detection of a compound that may be contained within the vapor sample; and

a multi-dimensional user indicator, the user indicator in communication with the controller to receive and operate in response to the indicator signal to indicate the relative concentration of the compound detected within the vapor sample for presentation via a multi-directional stimulus to a user of the vapor analysis system  
~~The vapor analysis system of claim 1 wherein the sample probe includes a substance filter disposed within the vapor channel, the substance filter capable of filtering at least one substance from the vapor sample as the vapor sample is collected through the vapor channel;~~

wherein the substance filter includes a particulate filter trap to extract and contain particulate matter from the vapor channel as the vapor sample is collected;

wherein the substance filter includes a liquid filter trap to extract and contain liquid from the vapor channel as the vapor sample is collected;

wherein the liquid filter trap is constructed of a translucent material;

wherein the housing of the sample probe defines a liquid filter trap containment section to position and maintain the liquid filter trap within the vapor



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channel at a location after the substance filter in a path of vapor sample travel;  
and

wherein the liquid filter trap containment section defines a liquid filter trap window that allows the user of the vapor analysis system to visually inspect the contents of the liquid filter trap to determine if liquid is contained within the liquid filter trap.

9. (Original) The vapor analysis system of claim 8 wherein the substance filter is removable from the sample probe.

~~10. (Canceled) The vapor analysis system of claim 8 wherein the substance filter includes a particulate filter trap to extract and contain particulate matter from the vapor channel as the vapor sample is collected.~~

~~11. (Canceled) The vapor analysis system of claim 10 wherein the substance filter includes a liquid filter trap to extract and contain liquid from the vapor channel as the vapor sample is collected.~~

~~12. (Canceled) The vapor analysis of claim 11 wherein:~~  
~~—— the liquid filter trap is constructed of a translucent material;~~  
~~—— the housing of the sample probe defines a liquid filter trap containment section to position and maintain the liquid filter trap within the vapor channel at a location after the substance filter in a path of vapor sample travel; and~~  
~~—— wherein the liquid filter trap containment section defines a liquid filter trap window that allows the user of the vapor analysis system to visually inspect the contents of the liquid filter trap to determine if liquid is contained within the liquid filter trap.~~

13. (Original) The vapor analysis system of claim 1 wherein the sample probe includes a flexible sample probe tip coupled to a first end of the vapor channel,

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the flexible sample probe tip being manually positionable by the user along an sample axis that is different that a central axis of the vapor channel within the sample probe.

14. (Original) The vapor analysis system of claim 1 wherein the vapor cable has an input end that can be coupled and decoupled from an output end of the vapor channel of the sample probe and has an output end that can be coupled and decoupled from an interface of the vapor analysis system that channels the vapor sample to the vapor analyzer, such that the vapor cable can be replaced in an event of contamination or damage.

15. (Original) The vapor analysis system of claim 1 further comprising:  
a storage device coupled to the controller, the storage device maintaining:  
i) a control program that the controller can execute to cause the controller to perform processing operations associated with operation of the vapor analysis system including controlling operation of the vapor analyzer to test for the existence of the compound in the vapor sample;  
ii) a route entry database containing a plurality of user-defined route entry records, each route entry record corresponding to a leak point at which the user of the vapor analysis system operates the sample probe of the vapor analysis system to test for the presence of a compound in a respective vapor sample collected at that vapor testing point; and  
each route entry record including at least one route entry field that has a field size and field type that can be changed by the user to correspond to a variety of different field sizes and field types required by different vapor analysis software programs that can download the route entry database for post processing after collection of vapor samples for route entry records.

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16. (Original) The vapor analysis system of claim 15 wherein the storage device is a removable storage device medium that, when removed from the vapor analysis system, persistently maintains the route entry database including a respective concentration level of the compound detected for each vapor sample associated with a respective route entry record corresponding to a vapor testing point.

17. (Original) The vapor analysis system of claim 15 wherein:

the control program can be remotely re-programmed using a configuration computer system coupled via an interface to the controller to allow a user of the configuration computer system to upload the control program into the memory of the vapor analysis system to allow the control program to be adapted to collect user-defined vapor analysis route entry record data associated with the concentration of the compound in a vapor sample in a route entry record format maintained in the route entry database that is compatible with vapor analysis data processing software that operates on the configuration computer system.

18. (Original) The vapor analysis system of claim 17 wherein the user of the configuration computer system can configure the control program to save route entry record data in the route entry database in a user definable field format that includes, for each route entry record, a time of vapor sample collection, a date of vapor sample collection, a concentration level of the compound that the vapor analyzer detects within the vapor sample, and a location of vapor sample collection.

19. (Original) The vapor analysis system of claim 15 further comprising:

a data entry device in communication with the controller, the data entry device comprising:

a set of data entry keys for user input of information into the control program operating in the controller;

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a set of special function keys that, when operated by the user, cause the control program to invoke a series of predefined instructions that control vapor analysis mechanisms within the vapor analyzer without the user having to interact with a system housing that contains the controller and the vapor analyzer; and

a user enter key that also provides the user enter signal to the controller.

20. (Original) The vapor analysis system of claim 19 wherein:

the data entry device includes a display capable of displaying multiple rows and columns of characters to provide visual output information to the user from the controller during operation of the control program; and

wherein at least one route entry field of at least one route entry record in the route entry database includes a menu that the control program can display on the display of the data entry device, the menu defining a set of user-defined and user selectable choices associated with operation of the vapor analysis system; and

wherein during an operational mode of the control program, the control program identifying a menu associated with that operational mode and displaying the menu on the display of the data entry device during that operational mode;

the control program receiving a user selectable choice from the displayed menu and processing the user selectable choice to perform at least one of:

- i) entering a different operational mode;
- ii) saving the user selectable choice into a field of the route entry record for the leak point; and
- iii) displaying a pick list associated with the user selectable choice and awaiting selection of another user selectable choice from the pick list;
- iv) displaying user defined fields from a user defined route entry record in the route entry database; and

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v) allowing a user to edit route entry information associated with the route entry record in the route entry database to perform at least one modification of existing data in the route entry record and creation of a new route entry record.

21. (Original) The vapor analysis system of claim 20 wherein the pick list defined in a route entry record for at least one leak point is at least one of:

a leak source and repair pick list that identifies a leak source and plurality of leak point repair methods and wherein the control program displays the leaks source and repair pick list on the display of the data entry device to receive a user selectable choice corresponding to a source of a leak and a type of repair operation that the user performed on the leak point.

22. (Previously Presented) The vapor analysis system of claim 20 wherein the control program receives a comment entry command that causes the control program to prompt the user for a comment string on the display of the keypad device, the control program receiving the comment string and storing the comment string in a route entry field associated with the route entry record for the leak point.

23. (Original) The vapor analysis system of claim 1 further comprising:

a leak point identification mechanism coupled to the controller, the leak point identification mechanism providing, to the controller, leak point identification data corresponding to a location of a leak point from which the vapor sample is collected, the leak point identification data being generated by the leak point identification mechanism in the survey mode to identify the leak point, the control program operating in the controller saving the leak point identification data in a route entry record of the route entry database upon activation of the user actuator disposed on the sample probe.

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24. (Original) The vapor analysis system of claim 23 wherein the leak point identification mechanism is at least one of:

a global positioning system transceiver capable of detecting a global position location value upon user activation of the user actuator and providing the global position location value as the leak point identification value to the controller for storage within the route entry associated with leak point from which the vapor sample is collected; and

a radio frequency tag identification reading mechanism capable of reading a tag identity of a leak point from a radio frequency tag positioned in proximity to the leak point, and providing the tag identity as the leak point identification value to the controller for storage within the route entry associated with the leak point from which the vapor sample is collected.

25. (Withdrawn) In a vapor analysis system including a vapor analyzer coupled to a controller and a sample probe coupled to the controller, the sample probe including a multi-dimensional user indicator disposed on a housing of the sample probe, the user indicator in communication with the controller to receive and operate in response to an indicator signal from the controller to indicate the relative concentration of the compound detected within the vapor sample for presentation via a multi-directional stimulus to a user of the vapor analysis system, a method for detecting a compound that may be contained within the vapor sample, the method comprising:

operating the vapor analysis system in a survey mode to continually collect and monitor the vapor sample for detection of the compound that may be contained within the vapor sample;

modulating an indicator signal to control an operation of the user indicator on the sample probe relative to the concentration of the compound detected by the vapor analyzer within the vapor sample such that a detected change in concentration of the compound causes a change in modulation of the indicator signal; and

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detecting a threshold concentration of the compound in the vapor sample that exceeds a predetermined value and in response, modulating the indicator signal according to a predetermined threshold indicator signal modulation pattern to modulate the user indicator on the sample probe such that the user of the sample probe can determine that the vapor analyzer has detected the threshold concentration of the compound.

26. (Withdrawn) The method of claim 25 comprising:

- during the survey mode, receiving a first user enter signal corresponding to a first activation of the user actuator by the user of the vapor analysis system;

- in response to the first user enter signal, entering a sampling mode to begin recording the concentration of the compound that may be contained within the vapor sample for a predetermined sampling time period;

- during the sampling mode, providing a sampling complete indicator signal modulation pattern to modulate the user indicator on the sample probe to indicate to the user that the control program is operating in the sampling mode; and

- after the predetermined sampling time period has elapsed, entering a sampling complete mode and providing a sampling complete indicator signal modulation pattern to modulate the user indicator on the sample probe to indicate to the user that the sampling mode is complete.

27. (Withdrawn) The method of claim 26 comprising:

- during the sampling complete mode, receiving a second user enter signal corresponding to a second activation of the user actuator by the user of the vapor analysis system; and

- in response to the second user enter signal:

- i) saving the recorded concentration of the compound associated with the vapor sample in a route entry record of a route entry database maintained in a storage device coupled to the controller, the route entry record corresponding to a leak point near which the user operated the

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sample probe to collect the vapor sample from which the concentration of the compound was detected and recorded; and

ii) re-entering the survey mode to begin collecting a vapor sample again for a next leak point defined by a next route entry record in the route entry database.

28. (Withdrawn) The method of claim 27 comprising:

repeating the processing operations of:

operating the vapor analyzer in the survey mode;

receiving the first user enter signal in survey mode to cause operation of the vapor analyzer in the sampling mode for the predetermined testing period; and

upon expiration of the predetermined sampling period, operating the vapor analyzer in the sampling complete mode and receiving the second user enter signal causing the controller to save the recoded concentration of the compound and re-enter the survey mode;

for a plurality of route entry records in the route entry database, such that a user of the vapor analysis system can perform testing of a plurality of leak points, each corresponding to a route entry in the route entry database, by only operating the user actuator on the sample probe and by viewing the user indicator on the sample probe to determine an operating mode of the control program.

29. (Withdrawn) The method of claim 28 wherein:

the vapor analysis system includes a data entry device including a display capable of displaying multiple rows and columns of characters to provide visual output information during operation of the vapor analysis system;



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wherein at least one route entry field of at least one route entry record in the route entry database that the control program can display on the display of the data entry device, and wherein the method comprises:

identifying a menu associated with an operational mode and displaying the menu on the display of the data entry device during that operational mode;

receiving a user selectable choice from the displayed menu and processing the user selectable choice to perform at least one of:

- i) entering a different operational mode;
- ii) saving the user selectable choice into a field of the route entry record for the leak point;
- iii) displaying a pick list associated with the user selectable choice and awaiting selection of another user selectable choice from the pick list;
- iv) displaying user defined fields from a user defined route entry record in the route entry database; and
- v) allowing a user to edit route entry information associated with the route entry record in the route entry database to perform at least one of modification of existing data in the route entry record and create of a new route entry record.

30. (Withdrawn) A sample probe comprising:

a housing supporting a vapor channel through which a vapor sample can be collected for distribution to a vapor analyzer;

a multi-dimensional user indicator disposed on the housing, the user indicator capable of receiving and operating in response to an indicator signal to indicate a relative concentration of a compound detected by a vapor analyzer in the vapor sample for presentation via a multi-directional stimulus to a user of the vapor analysis system; and

a user actuator disposed on or within the housing, the user actuator being operable using a hand of the user that simultaneously holds the housing.

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31. (Withdrawn) The sample probe of claim 30 wherein the user indicator comprises a light pipe disposed around a perimeter of the housing of the sample probe.

32. (Withdrawn) The sample probe of claim 31 wherein the sample probe includes a substance filter disposed within the vapor channel, the substance filter capable of filtering at least one substance from the vapor sample as the vapor sample is collected through the vapor channel.

33. (Withdrawn) The sample probe of claim 32 wherein the substance filter is removable from the sample probe.

34. (Withdrawn) The sample probe of claim 32 wherein the substance filter includes a particulate filter trap to extract and contain particulate matter from the vapor channel as the vapor sample is collected.

35. (Withdrawn) The sample probe of claim 34 wherein the substance filter includes a liquid filter trap to extract and contain liquid from the vapor channel as the vapor sample is collected.

36. (Withdrawn) The sample probe of claim 35 wherein:  
the liquid filter trap is constructed of a translucent material;  
the housing of the sample probe defines a liquid filter trap containment section to position and maintain the liquid filter trap within the vapor channel at a location after the substance filter in a path of vapor sample travel; and  
wherein the liquid filter trap containment section defines a liquid filter trap window that allows the user of the vapor analysis system to visually inspect the contents of the liquid filter trap to determine if liquid is contained within the liquid filter trap.

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37. (Withdrawn) The sample probe of claim 30 wherein the sample probe includes a flexible sample probe tip coupled to a first end of the vapor channel, the flexible sample probe tip being manually positionable by the user along an sample axis that is different that a central axis of the vapor channel within the sample probe.

38. (Withdrawn) The sample probe of claim 30 wherein when activated, the user indicator produces a multi-directional signal from a of the sample probe that is visible by the user of the sample probe from opposing positions that are perpendicular and opposite to each other related to a central axis of the sample probe housing.

39. (Withdrawn) A computer program product comprising a computer-readable medium including computer program logic encoded thereon that, when executed on at least one controller with a vapor analysis system that includes a vapor analyzer coupled to the controller and a sample probe coupled to the controller, the sample probe including a multi-dimensional user indicator disposed on a housing of the sample probe, the user indicator in communication with the controller to receive and operate in response to an indicator signal from the controller to indicate the relative concentration of the compound detected within the vapor sample for presentation via a multi-directional stimulus to a user of the vapor analysis system, causes the vapor analysis system to detect a compound that may be contained within the vapor sample by performing the operations of:

operating the vapor analysis system in a survey mode to continually collect and monitor the vapor sample for detection of the compound that may be contained within the vapor sample;

modulating an indicator signal to control an operation of the user indicator on the sample probe relative to the concentration of the compound detected by the vapor analyzer within the vapor sample such that a detected change in

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concentration of the compound causes a change in modulation of the indicator signal;

detecting a threshold concentration of the compound in the vapor sample that exceeds a predetermined value and in response, modulating the indicator signal according to a predetermined threshold indicator signal modulation pattern to modulate the user indicator on the sample probe such that the user of the sample probe can determine that the vapor analyzer has detected the threshold concentration of the compound.

40. (Currently Amended) A vapor analysis system comprising:

a vapor analyzer for analyzing a vapor sample to detect a compound that may be contained within the vapor sample;

a controller coupled to the vapor analyzer and operable to produce an indicator signal indicative of a relative concentration of the compound detected by the vapor analyzer;

a sample probe including (a) a vapor channel through which the vapor sample is collected and (b) a user indicator in communication with the controller, said user indicator operable to receive the indicator signal and to respond to the indicator signal by presenting to a user of the probe a multi-dimensional stimulus indicative of the relative concentration of the compound detected within the vapor sample; and

a vapor cable for passing the vapor sample from the vapor channel of the sample probe to the vapor analyzer; and

wherein the sample probe includes a housing containing the vapor channel, the user indicator comprises a light pipe disposed around the perimeter of a portion of said housing, and the controller is operable to modulate the level of the indicator signal so as to control the level of light emitted by the light pipe relative to the concentration of the compound detected within the vapor sample.

41. (Original) The vapor analysis system of claim 40 wherein the controller is

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operable to modulate the level of the indicator signal in response to changes in concentration of the compound detected within the vapor sample.

42. (Canceled) ~~The vapor analysis system of claim 40 wherein the sample probe includes a housing containing the vapor channel, the user indicator comprises a light pipe disposed around the perimeter of a portion of said housing, and the controller is operable to modulate the level of the indicator signal so as to control the level of light emitted by the light pipe relative to the concentration of the compound detected within the vapor sample.~~

43. (Original) The vapor analysis system of claim 40 wherein the sample probe includes a probe housing containing the vapor channel, the user indicator comprises a speaker or audible transducer disposed on or within said housing, and the controller is operable to modulate the intensity of the indicator signal so as to control the intensity of sound emitted by the speaker or audible transducer relative to the concentration of the compound detected within the vapor sample.

44. (Original) The vapor analysis system of claim 40 further including a data storage device coupled to the controller, said data storage device operable to maintain a route entry database with data relating to a route of locations and to store data on the compounds detected within vapor samples collected at said locations.

45. (Original) The vapor analysis system of claim 44 wherein the controller includes a control program, and the sample probe includes a user actuator in data communication with the controller to enable a user to transmit a user enter signal to the controller in order to change the mode of operation of the control program.

46. (Original) The vapor analysis system of claim 45 wherein the controller and

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the computer program are operable in a survey mode to cause the vapor analyzer to continually analyze a vapor sample passed to it through the vapor cable and for the controller to provide an indicator signal with a predetermined threshold modulation pattern when the vapor analyzer detects a concentration of the compound that exceeds a predetermined value.

47. (Original) The vapor analysis system of claim 45 wherein the controller and the computer program are operable, in response to a first activation of the user actuator, to cause the vapor analyzer to continually analyze a vapor sample during a predetermined sampling time period and for the controller to provide an indicator signal with a predetermined sampling modulation pattern during the sampling time period and an indicator signal with a testing complete indicator signal modulation pattern at the end of the sampling time period.

48. (Original) The vapor analysis system of claim 47 wherein the controller and the computer program are operable, in response to a second activation of the user actuator, to save the recorded concentration of the compound associated with the vapor sample in said data storage device as a route entry record of the route entry database.

49. (Original) The vapor analysis system of claim 46 further comprising:  
a leak point identification mechanism coupled to the controller, the leak point identification mechanism operable to provide, to the controller, leak point identification data corresponding to a location of a leak point from which the vapor sample is collected, the leak point identification data being generated by the leak point identification mechanism in the survey mode to identify the leak point, the control program operable to save the leak point identification data in a route entry record of the route entry database upon activation of the user actuator.

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50. (Original) The vapor analysis system of claim 49 wherein the leak point identification mechanism is at least one of:

a global positioning system transceiver capable of detecting a global position location value upon user activation of the user actuator and providing the global position location value as the leak point identification value to the controller for storage within the route entry associated with leak point from which the vapor sample is collected; and

a radio frequency tag identification reading mechanism capable of reading a tag identity of a leak point from a radio frequency tag positioned in proximity to the leak point, and providing the tag identity as the leak point identification value to the controller for storage within the route entry associated with the leak point from which the vapor sample is collected.

51. (Withdrawn) A method of operating a vapor analysis system which includes a sample probe and a vapor analyzer, comprising:

operating the vapor analysis system in a survey mode in which a vapor sample is continually collected by the sample probe and analyzed by the vapor analyzer; and

upon detection by the vapor analyzer of a threshold concentration of a compound in the vapor sample, causing the sample probe to emit a multi-dimensional stimulus from which a user can determine that the vapor analyzer has detected the threshold concentration of the compound.

52. (Withdrawn) The method of claim 51 comprising:

during the survey mode, providing a first user enter signal from the sample probe to a controller that is connected to the vapor analyzer and to the sample probe;

in response to the first user enter signal, entering a sampling mode to begin recording the concentration of the compound;

during the sampling mode, directing a testing indicator signal modulation

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pattern to the sample probe to cause the probe to emit a multi-dimensional stimulus from which a user can sense that the vapor analysis system is operating in the sampling mode; and

after a predetermined testing time period has elapsed, directing a testing complete indicator signal modulation pattern to the sample probe to cause the probe to emit a multi-dimensional stimulus from which a user can sense that the sampling mode is complete.

53. (Withdrawn) The method of claim 52 comprising:

during the sampling complete mode, providing a second user enter signal from the sample probe to the controller corresponding to a second activation of the user actuator by the user of the vapor analysis system; and

in response to the second user enter signal:

i) saving the recorded concentration of the compound associated with the vapor sample in a route entry record of a route entry database maintained in a storage device coupled to the controller, the route entry record corresponding to a leak point near which the user operated the sample probe to collect the vapor sample from which the concentration of the compound was detected and recorded; and

ii) re-entering the survey mode to begin collecting a vapor sample again for a next leak point defined by a next route entry record in the route entry database.

54. (Withdrawn) The method of claim 53 comprising, for a plurality of route entry records in the route entry database which correspond to leak points at which it may be desirable to collect and analyze vapor samples, repeating the processing operations of:

operating the vapor analysis system in the survey mode;

during the survey mode, providing a first user enter signal from the sample probe to initiate operation in the sampling mode;



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upon expiration of the predetermined sampling time period, providing a second user enter signal from the sample probe to cause the controller to save the recorded concentration of the compound and to re-enter the survey mode;

whereby a user of the vapor analysis system can perform testing of the plurality of leak points by activating the sample probe to provide user enter signals in response to multi-dimensional stimuli from the sample probe.

55. (Withdrawn) A sample probe for use with a vapor analyzer comprising:

a housing supporting a vapor channel for collecting a vapor sample for distribution to a vapor analyzer;

a user indicator disposed on or within the housing, said user indicator operable in response to a signal from the vapor analyzer to present a multi-dimensional stimulus indicative of the relative concentration of a compound detected by the vapor analyzer; and

a user actuator disposed on or within the housing and operable by use of a same hand by which a user simultaneously holds the sample probe.

56. (Withdrawn) The sample probe of claim 55 wherein the user indicator comprises a light pipe disposed about a perimeter of the housing, said user indicator operable to present a light signal that is visible to a user when the user holds the probe in any of a plurality of different orientations that are orthogonal to one another.

57. (Previously Presented) The vapor analysis system of claim 1, wherein the multi-dimensional user indicator is a non-planar indicator disposed around a perimeter of the sample probe to produce the multi-directional stimulus for sensing by the user.

58. (Previously Presented) The vapor analysis system of claim 57, the controller is configured to produce a predetermined threshold indicator signal modulation

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pattern when the vapor analyzer detects a threshold concentration of the compound that exceeds a predetermined value such that the user of the sample probe can detect, based on the multi-directional stimulus as produced by the multi-dimensional indicator, that the vapor analyzer has detected the threshold concentration of the compound.

59. (Previously Presented) The vapor analysis system of claim 40, wherein the multi-dimensional stimulus indicative of the relative concentration is provided by a non-planar indicator disposed around a perimeter of the sample probe.